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(54) **Method for producing filler-containing colored thermoplastic resin composition.**

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Description

BACKGROUND OF THE INVENTION

The present invention relates to a method for producing a colored resin composition which has superior pigment dispersibility and impact resistance and which can be utilized as shaped articles, sheets and films made by injection molding or extrusion molding, said composition comprising a thermoplastic resin composition to which pigment is incorporated.

As coloring agents for filler-containing colored thermoplastic resin compositions, there are generally used unprocessed pigments or processed pigments in which metallic soaps such as zinc stearate and magnesium stearate or dispersion mediums such as wax and fatty acid are blended with unprocessed pigments. Usually, pigments processed or not and fillers are added together to thermoplastic resins and the mixture is melt kneaded by extruders, Banbury mixers, kneaders or the like, thereby to improve properties such as heat resistance, rigidity, flame retardance, dimensional stability, printability, coatability and adhesion.

However, in the case of unprocessed pigments, high-performance kneading machines such as twin-screw extruders and Banbury mixers are required and besides color development is unstable. In the case of simultaneous blending of processed pigments, fillers and thermoplastic resins, dispersion medium for the pigment are adsorbed to the fillers at the melt kneading step and no good dispersion of pigments is attained even by high-performance kneading machines such as twin-screw extruders and Banbury mixers. Such poor dispersion of pigments results in reduction of color density, uneven coloration and deterioration of properties and value of products is extremely lowered.

JP-A-63 113057 relates to pigment master batch consisting of pigment, dispersion medium and polypropylene. The master batch is added to fillers and thermoplastic resins. The mixture is injection molded until colored resin compound is obtained.

A conventional method for production of a filler-containing colored thermoplastic resin composition comprises simultaneously and uniformly mixing all of thermoplastic resins or thermoplastic resin compositions, fillers and pigments, melt kneading the mixture by melt kneading apparatuses such as extruders, Banbury mixers or kneaders and pelletizing. However, in the case where pigments are dry colored or master powder, this method has problems that the fillers are adsorbed to dispersion medium for the pigments at the melt kneading step and pigment agglomerate is produced, thereby reduction of color density, deterioration of gloss and decrease of impact strength are brought about owing to poor pigment dispersion.

An approach to dissolve the problem is made by carrying out simultaneous melt kneading in the same manner as above using a pigment master batch comprising dry color or master powder and a thermoplastic resin used as a carrier resin, thereby to pelletize the master batch. According to this method, an improvement of pigment dispersibility is recognized, but the products are insufficient in heat resistance and impact resistance in the field of recent industrial parts which require high level in these properties. Furthermore, there are economical problems in that use of pigment master batch brings about increase in cost.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a method for producing a filler-containing colored thermoplastic resin composition superior in pigment dispersion and improved in appearance such as smoothness and coloration and impact resistance by using a melt kneading apparatus.

The filler-containing colored thermoplastic resin composition of the present invention is suitable for use in the fields of industrial parts such as automobiles and appliance parts which require heat resistance and impact resistance of high level.

DESCRIPTION OF THE INVENTION

The present invention relates to a method for producing a filler-containing colored thermoplastic resin composition (F) which comprises melt kneading a filler (C) with at least a part of components of resin consisting of a thermoplastic resin (A) and/or a thermoplastic resin composition (B), adding remainder of the resin, if any, with a processed pigment (E) to the mixture, and then further carrying out continuous melt kneading. Alternatively, it provides a method for producing a filler-containing thermoplastic resin composition (F) which comprises melt-kneading a filler (C) with at least a part of a thermoplastic resin (A) and/or at

least a part of one of compositions of a thermoplastic resin composition (B), solidifying the mixture to prepare a filler master batch (G), and then melt-kneading a mixture of the master batch (G), the remainder of (A) and/or (B), if any, and a processed pigment (E).

The thermoplastic resin (A) is a crystalline polypropylene. It includes (1) homopolymer of propylene, (2) block copolymer obtained by polymerizing propylene at the first step and copolymerizing ethylene and α-olefin such as propylene or butene-1 at the second step and (3) random copolymer obtained by polymerizing propylene at the first step and copolymerizing propylene and α-olefin such as ethylene or butene-1.

The polypropylene in the present filler-containing colored thermoplastic resin composition which is used for articles which require heat resistance and rigidity, is preferably a homopolymer of propylene or a highly crystalline polypropylene such as the block copolymer wherein a homopolymer portion which is the first segment polymerized at the first step has an isotactic pentad fraction of boiling heptane-insoluble portion of 0.970 or more, a boiling heptane-soluble content of 5.0 % by weight or less and a 20 °C xylene-soluble content of 2.0 % by weight or less. The polypropylene in the present filler-containing colored thermoplastic resin composition which is used for articles which require imact resistance, is preferably a propylene block copolymer which comprises homopolymer portion of propylene which is polymerized at the first step and a polymer of ethylene and α-olefin such as propylene or butene-1 polymerized at the second step.

The thermoplastic resin composition (B) is a composition comprising the above-mentioned polypropylene (A) and ethylene-propylene copolymer rubber (H). In place of the rubber (H), ethylene-propylene-non-conjugated diene copolymer rubber (I) or ethylene-butene-1 copolymer rubber (J) may be used.

The ethylene-propylene copolymer rubber (H) has an ethylene content of 15 - 85 % by weight, preferably 40 - 80 % by weight. That is, highly crystalline copolymer having an ethylene content of higher that 85 % by weight is difficult to process under usual rubber molding conditions and that of lower than 15 % by weight in ethylene content has increased glass transition temperature (Tg) and loses rubber-like properties. This is not preferred. Number-average molecular weight of ethylene-propylene copolymer rubber is preferably such that it can be kneaded in an extruder, namely, 10,000 - 100,000. If the molecular weight is too small, handling for feeding to extruder is difficult and if it is too large, flowability is small and processing is difficult.

For ethylene-propylene-non-conjugated diene copolymer rubber, it is preferred that non-conjugated diene content in raw material rubber is 3 % by weight or less. If non-conjugated diene content is more than 3% by weight, gelation occurs at kneading and this is not preferred. Ethylene-butene-1 copolymer rubber has an ethylene content of 15 - 85 % by weight, preferably 40 - 80 % by weight. Mixing ratio of polypropylene/ethylene-butene-1 copolymer rubber is 55/44 - 99/1 in weight ratio.

Filler (C) used in the present invention includes, for example, inorganic fillers such as talc, calcium carbonate, mica, barium sulfate, and clay, glass fibers and carbon fibers. When improvement in rigidity and heat resistance of the composition of the present invention is aimed at, it is preferred to use talc, mica and calcium carbonate as filler (C).

Filler-containing thermoplastic resin composition (D) is a composition comprising polypropylene (A), ethylene-propylene copolymer rubber (H) or ethylene-propylene-non-conjugated diene copolymer rubber (I) and filler (C). Alternatively, the (D) is a composition comprising polypropylene (A) and filler (C). It is desired to have a melt flow rate of at least 5 g/10 min., preferably at least 10 g/10 min.

This filler-containing thermoplastic resin composition (D) can be produced by melt kneading of the components using extruders, Banbury mixers, kneaders and the like.

Pigment (E) used in the present invention is a processed pigment comprising an unprocessed pigment mixed with a dispersion medium. Example of unprocessed pigments includes organic pigments such as polyazo pigments, quinacridone pigments, phthalocyanine pigments, and perillene•perinone pigments, inorganic pigments such as titanium oxide, ultramarine and iron oxide, and carbon black.

Preferred are an organic pigment selected from the group consisting of polyazo red and phthalocyanine blue, an inorganic pigment selected from the group consisting of titanium oxide and red oxide, carbon black, or a mixed pigment thereof.

These pigments are so insufficient in dispersion and coloration stability that processed pigments as exemplified below are used. One of the processed pigments is, a dry colored product obtained by high speed mixing by Henschel mixer of the unprocessed pigment and a metallic salt of higher fatty acid such as stearic acid or lauric acid as a dispersion medium. Another processed pigment is master powder obtained by melt kneading the unprocessed pigment and polyethylene wax prepared by heat decomposition of polyethylene under suitable conditions or by polymerizing ethylene under suitable conditions as a dispersion medium by melt kneading apparatuses such as extruders, Banbury mixers, kneaders and roll mills. The other processed pigment is master powder obtained by melt-kneading the unprocessed pigment

and polypropylene wax prepared by heat decomposition of polypropylene under suitable conditions or by polymerizing propylene under suitable conditions as a dispersion medium by melt-kneading apparatuses such as extruders, Banbury mixers, kneaders and roll mills. The other processed pigment is master batch obtained by melt-kneading the above dry colored or master powder together with a thermoplastic resin such as polyethylene or polypropylene as a carrier resin by a melt-kneading apparatuses such as extruders, Banbury mixers and kneaders.

The filler-containing colored thermoplastic resin composition (F) of the present invention is a composition comprising the polypropylene, the filler and the pigment explained above. Alternatively, the composition (F) is a composition comprising the polypropylene, the ethylene-propylene copolymer rubber (H) or the ethylene-propylene-non-conjugated diene copolymer rubber (I), fillers (C) and the pigments.

As kneading apparatuses, there may be used melt-kneading apparatuses such as extruders, Banbury mixers and kneaders, but preferred are extruders and more preferred are twin-screw extruders in that continuous production is possible and separate feeding is possible.

Kneading is effected, for example, by previously homogeneously mixing polypropylene (A) or (B) a mixture of polypropylene and one of rubbers selected from ethylene-propylene copolymer rubber (H), ethylene-propylene-non-conjugated diene copolymer rubber (I) and ethylene-butene-1 copolymer rubber (J) with filler (C), melt-kneading the mixture by a melt-kneading apparatus and further adding processed pigments (E) to the resulting melt and carrying out continous kneading. Alternatively, the kneading is carried out by previously homogeneously mixing at least a part of polypropylene (A), and/or at least a part of one of components of (B) selected from polypropylene, ethylene-propylene copolymer rubber (H), ethylene-propylene-non-conjugated diene copolymer rubber (I) and ethylene-butene-1 copolymer rubber (J) and the whole of filler (C), melt-kneading and pelletizing the mixture by a melt-kneading apparatus to obtain a filler master batch (G), homogeneously mixing this filler master batch (G) with the remainder of polypropylene (A) and/or the remainder of components of (B), i.e., polypropylene, ethylene-propylene copolymer rubber, ethylene-propylene-non-conjugated diene copolymer rubber or ethylene-butene-1 copolymer rubber, if any, and processed pigments (E) and melt-kneading the mixture by a melt-kneading apparatus.

By melting or pelletizing the filler with the thermoplastic resin or thermoplastic resin composition, the filler is uniformly dispersed therein and furthermore, the filler surface is coated with the thermoplastic resin or thermplastic resin composition and thus agglomerate of pigment is not produced but a filler-containing colored thermoplastic resin composition superior in pigment dispersion can be obtained.

The present invention is specifically explained by the following examples.

In the examples, measuring methods of properties are as follows.

(1) Dispersibility

A plate-like test piece of 3 mm thick was pressed under 121.6 bar (120 atm.), at 230 °C for 3 minutes into a thin film sheet and then particle diameters of pigment and filler were observed by a polarizing optical microscope at 50 x magnification, whereby dispersibility was evaluated.

Dispersibility was determined from maximum particle diameter in terms of circle of pigment particles in the field of the polarizing optical microscope according to the following criteria.

Grade	
5	maximum particle diameter 10 μm or less
4	maximum particle diameter 10 - 30 μm
3	maximum particle diameter 30 - 50 μm
2	maximum particle diameter 50 - 100 μm
1	maximum particle diameter greater than 100 μm

(2) Falling weight impact test (FWI)

Measurement was conducted according to the method specified in JIS-K722 at 23 °C.

The plate-like test piece used above was prepared by drying the composition at 120 °C for 2 hours by a hot-air drier and then injection molding the composition by an injection molding machine IS150E-V manufactured by Toshiba Machine Co., Ltd. at a molding temperature of 220 °C and a mold temperature of 50 °C for an injection time of 15 seconds and cooling time of 30 seconds.

(3) Conditions for production of composition

The composition was prepared under the following conditions unless otherwise notified.

Respective components of given amounts were weighed and homogeneously premixed by Henschel mixer and then the mixture was extruded by a continuous twin-screw extruder (TEX 44 SS 30BW-2V manufactured by Japan Steel Works, Co. Ltd.) at an extrusion amount of 30 kg/h, a resin temperature of 220 °C and a screw speed of 350 rpm under suction by vent. Screws comprising three flight type rotors and kneading discs were provided at two positions in a kneading zone, i.e., the one in a zone next to the first opening and the other in a feed opening, respectively.

Examples 1 - 3 and Comparative Examples 1 - 3

Thermoplastic resin A: Polypropylene (NOBLEN® AX574, Sumitomo Chemical Co., Ltd.);

Thermoplastic resin composition (B): Polypropylene (NOBLEN®, Sumitomo Chemical Co., Ltd.)-/ethylene-propylene copolymer rubber (ESPRENE® E120P, Sumitomo Chemical Co., Ltd.) (40/5 by weight);

Filler (C): Talc (MICRONWHITE 5000S, Hayashi Kasei);

Processed pigments: Carbon black (BLACKPEARL 800, Cabot Co.) dispersed in magnesium stearate (Sakai Kakagu), polyethylene wax (AC WAX, Allied Chemical Corp.) or polypropylene wax (HOECHST WAX PP-230, Hoechst AG.) (1 : 1 by weight), respectively. High speed mixers auch as Henschel mixer were used for dispersion in magnesium stearate and kneader mixers such as rolls were used for dispersion in polyethylene wax or polypropylene wax, and then the dispersions were pulverized.

The above (A), (B) and (C) were mixed at a ratio of 35/45/20 (by weight), fed from the first feed opening and melt-kneaded under given kneading conditions with feeding the processed pigment (1.75 parts by weight every 100 parts by weight of the total of (A), (B) and (C)) from the second feeding opening to obtain the present filler-containing colored thermoplastic resin composition.

As comparative examples, the same raw materials and the same processed pigment as above were homogeneously mixed at the same ratios as above and the mixture was fed from the first feed opening and melt-kneaded under the given kneading conditions to obtain compositions.

The resulting compositions were molded into test pieces under the given injection molding conditions and were evaluated by the given evaluation methods. The results of evaluation are shown in Tables 1 and 2.

In Examples 1 - 3 of the present invention where the pigment was separately fed, no agglomeration of talc and pigment occurs and dispersibility and falling weight impact strength were much improved as compared with Comparative Examples 1 - 3 where the raw materials and pigments were simultaneously fed and meld-kneaded.

Examples 4 - 6

The same raw materials as used in Examples 1 - 3 were weighed at the same mixing ratio as in Examples 1 - 3 and these raw materials other than pigment were melt-kneaded under the given melt-kneading conditions to obtain pellets.

This filler master batch composition was homogeneously mixed with the pigment used in Examples 1 - 3 and the mixture was melt-kneaded under the given kneading conditions to obtain compositions. The resulting compositions were evaluated in the same manner as in Examples 1 - 3.

By using a master batch of filler prepared with polypropylene and ethylene-propylene copolymer rubber, no agglomeration of talc and pigment occured but dispersibility and FWI value were at practically usable level.

Examples 7 - 8 and Comparative Examples 4 - 5

Compositions were prepared in the same manner as in Examples 1 - 2 and Comparative Examples 1 -2 for Examples 7 - 8 and Comparative Examples 4 -5, respectively except that phthalocyanine blue (CYANINE BLUE GH manufactured by Sumitomo Chemical Co., Ltd.) was used as pigment and these compositions were evaluated. The results of evaluation are shown in Tables 1 and 2.

Remarkable improvement was also attained with phthalocyanine blue like carbon black. Thus, by using the method of the present invention for production of filler-containing colored thermoplastic resin composition, agglomeration of filler and pigment is reduced, dispersibility of pigment is improved and increase of color density and remarkable improvement of impact resistance become possible.

Examples 9 - 12 and Comparative Example 6

60 Parts by weight of polypropylene (NOBLEN® AX574) and 20 parts by weight of polypropylene (NOBLEN® Z101A manufactured by Sumitomo Chemical Co., Ltd.) as thermoplastic resin (A) and 20 parts by weight of talc (MICRONWHITE 5000S manufactured by Hayashi Kasei Co.) as filler (C) were used.

Processed pigments were prepared using the same raw materials and by the same method as used in Examples 1 - 3.

The above thermoplastic resin (A) and filler (C) were homogeneously mixed at the given ratio and fed from the first feed opening and melt-kneaded under the given kneading conditions. Processed pigment (1.75 parts by weight every 100 parts by weight of the mixture of (A) and (C)) was fed from the second feed opening and was melt-kneaded to obtain the filler-containing colored thermoplastic resin composition of the present invention.

Separately, the same thermoplastic resin (A) and filler (C) as above were melt-kneaded at the same mixing ratio as above under the given kneading conditions to obtain a pelletized filler master batch (G). The given amount of pigment (E) was homogeneously mixed with the master batch (G) and the mixture was further melt-kneaded under the given kneading conditions to obtain a composition.

As Comparative Example 6, the same raw materials as above including the pigment were homogeneously mixed at the same mixing ratio as above and a composition was prepared in the same manner.

The resulting compositions were molded and evaluated in the same manner as in Examples 1 - 3. The results are shown in Tables 1 and 2.

According to the method for production of filler-containing colored thermoplastic resin composition of the present invention, where pigment is fed separately from other components as in Examples 9 - 11 or a filler master batch is previously prepared and then is compounded with pigment as in Example 12, agglomeration of talc and pigment can be prevented and dispersibility and falling weight impact strenght can be markedly improved as compared with the method of Comparative Example 6 where the raw materials are all simultaneously mixed and melt-kneaded.

Example 13

A filler-containing colored thermoplastic resin composition having the same composition as of Example 2 was prepared as follows.

Thermoplastic resin (A) and a filler (C) were melt-kneaded at the ratio of 35/20 by weight under the given kneading conditions to prepare a pelletized filler master batch (G) to which given amounts of a thermoplastic resin composition (B) and pigment (E) were uniformly mixed. The mixture was further melt-kneaded under the given conditions.

A composition obtained was molded and evaluated in the same manner as in Examples 1 - 3. The results are shown in Table 1.

Preparation of a master batch from a filler and a part of thermoplastic resin and/or a thermoplastic resin composition prevents from formation of agglomeration of talc and pigment and greatly improves dispersibility and falling weight impact strength of the resultant composition, compared with Comparative Example 2 where all of the elements are melt-kneaded at one time.

Example 14

A filler-containing colored thermoplastic resin composition having the same composition as of Example 10 was prepared as follows.

A part of thermoplastic resin (A), i.e., NOBLEN® AX574, and a filler (C) were melt-kneaded with a ratio of 30/20 by weight under the given kneading conditions to prepare a pelletized filler master batch to which given amounts of remainder of the thermoplastic resin (A), i.e., NOBLEN® AX574 and Z101A, and pigment (E) were uniformly mixed. Further melt-kneading was effected under the given conditions. A composition obtained was molded and evaluated in the same manner as in Examples 1 - 3. The results are shown in Table 1.

Preparation of a master batch from a part of thermoplastic resin and a filler causes no agglomeration of talc and pigment and improves dispersibility and falling weight impact strength of the resultant composition, compared with Comparative Example 6 where all of the elements were melt-kneaded at one time.

Table 1 Examples

No.	Method for production	Pigment		Evaluation	
		Kind of pigment	Dispersion medium	Dispersibility	FWI (kg cm)
1	Separate feeding	Carbon black	Magnesium stearate	4	240
2	ditto	ditto	Polyethylene wax	5	260
3	ditto	ditto	Polypropylene wax	5	250
4	Filler MB*	ditto	Magnesium stearate	5	260
5	ditto	ditto	Polyethylene wax	5	270
6	ditto	ditto	Polypropylene wax	5	260
7	Separate feeding	Phthalocyanine Blue	Magnesium stearate	4	240
8	ditto	ditto	Polyethylene wax	5	260
9	Separate feeding	Carbon black	Magnesium stearate	4	120
10	ditto	ditto	Polyethylene wax	5	140
11	ditto	ditto	Polypropylene wax	5	120
12	Filler MB*	ditto	Polyethylene wax	5	150
13	ditto	ditto	ditto	5	250
14	ditto	ditto	ditto	5	130

* Filler master batch

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Table 2 Comparative Examples

No.	Method for production	Pigment		Evaluation	
		Kind of pigment	Dispersion medium	Dispersibility	FWI (kg cm)
1	Simultaneous feeding	Carbon black	Magnesium stearate	1	110
2	ditto	ditto	Polyethylene wax	2	120
3	ditto	ditto	Polypropylene wax	2	100
4	ditto	Phthalocyanine blue	Magnesium stearate	1	120
5	ditto	ditto	Polyethylene wax	2	140
6	ditto	Carbon black	ditto	2	80

According to the method of the present invention, dispersibility of pigment is markedly improved and conspicuous effects are exhibited in increase of color density of the composition and balance of properties, especially in improvement of impact resistance.

The resin composition provided by the present invention can be easily processed into shaped articles by molding methods usually employed for thermoplastic resin such as injection molding and extrusion

molding and can be used for industrial parts which require heat resistance and impact resistance of high level such as automobile parts and appliance parts.

Claims

1. A method for producing a filler-containing colored thermoplastic resin composition (F) which comprises melt kneading a filler (C) with at least a part of components of resin consisting of a thermoplastic resin (A) and/or a thermoplastic resin composition (B) to obtain a coated filler, adding the remainder of (A) and/or (B), if any, and a processed pigment (E) comprising an unprocessed pigment and a dispersion medium to the coated filler, and then further carrying out continuous melt-kneading.

2. A method for producing a filler-containing colored thermoplastic resin composition (F) which comprises melt-kneading a filler (C) with at least a part of a thermoplastic resin (A) and/or at least a part of one of components of a thermoplastic resin composition (B), solidifying the mixture to prepare a filler master batch (G), and then melt-kneading a mixture of the master batch (G), the remainder of (A) and/or (B), if any, and a processed pigment (E) comprising an unprocessed pigment and a dispersion medium.

3. A method according to claim 1 or claim 2 wherein the thermoplastic resin (A) is polypropylene.

4. A method according to claim 1 or claim 2 wherein the thermoplastic resin composition (B) is a composition comprising polypropylene (A) and ethylene-propylene copolymer rubber (H), polypropylene (A) and ethylene-proplylene-non-conjugated diene copolymer rubber (I) or polypropylene (A) and ethylene-butene-1 copolymer rubber (J).

5. A method according to claim 1 or claim 2 wherein a thermoplastic resin composition (D) which is a composition comprising polypropylene and a filler, polypropylene and ethylene-propylene-copolymer rubber and a filler or polypropylene and ethylene-propylene- non conjugated diene copolymer rubber and a filler has a melt flow rate of at least 5g/10min.

6. A method according to claim 1 or claim 2 wherein the filler (C) is an inorganic filler selected from the group consisting of talc, mica and calcium carbonate.

7. A method according to claim 1 or claim 2 wherein the processed pigment (E) comprises an unprocessed pigment and a metallic salt of a fatty acid as a dispersion medium.

8. A method according to claim 1 or claim 2 wherein the processed pigment (E) comprises an unprocessed pigment and a polyethylene wax as a dispersion medium.

9. A method according to claim 1 or claim 2 wherein the processed pigment (E) comprises an unprocessed pigment and a polypropylene wax as a dispersion medium.

10. A method according to claim 1 or claim 2 wherein the processed pigment (E) contains an organic pigment selected from the group consisting of polyazo red and phthalocyanine blue, an inorganic pigment selected from the group consisting of titanium oxide and red oxide, carbon black, or a mixed pigment thereof.

Patentansprüche

1. Verfahren zur Herstellung einer füllstoffhaltigen gefärbten thermoplastischen Harzzusammensetzung (F), umfassend das Schmelzkneten eines Füllstoffs (C) mit mindestens einem Teil der Bestandteile des Harzes, bestehend aus einem thermoplastischen Harz (A) und/oder einer thermoplastischen Harzzusammensetzung (B) zum Erhalt eines beschichteten Füllstoffs, Zugabe des Restes von (A) und/oder (B), falls vorhanden, und eines behandelten Pigments (E), umfassend ein unbehandeltes Pigment und ein Dispersionsmedium, zu dem beschichteten Füllstoff und dann weiter Durchführen des kontinuierlichen Schmelzknetens.

2. Verfahren zur Herstellung einer füllstoffhaltigen gefärbten thermoplastischen Harzzusammensetzung (F), umfassend das Schmelzkneten eines Füllstoffs (C) mit mindestens einem Teil eines thermoplasti-

schen Harzes (A) und/oder mindestens einem Teil eines der Bestandteile einer thermoplastischen Harzzusammensetzung (B), Verfestigen des Gemisches, um ein Füllstoffmasterbatch (G) herzustellen, und dann Schmelzkneten eines Gemisches aus dem Masterbatch (G), dem Rest von (A) und/oder (B), falls vorhanden, und einem behandelten Pigment (E), umfassend ein unbehandeltes Pigment und ein Dispersionsmedium.

3. Verfahren nach Anspruch 1 oder 2, wobei das thermoplastische Harz (A) Polypropylen ist.

4. Verfahren nach Anspruch 1 oder 2, wobei die thermoplastische Harzzusammensetzung (B) eine Zusammensetzung, umfassend Polypropylen (A) und Ethylen-Propylen-Copolymerkautschuk (H), Polypropylen (A) und Ethylen-Propylennichtkonjugiertes Dien-Copolymerkautschuk (I) oder Polypropylen (A) und Ethylen-Buten-1-Copolymerkautschuk (J), ist.

5. Verfahren nach Anspruch 1 oder 2, wobei eine thermoplastische Harzzusammensetzung (D), die eine Zusammensetzung, umfassend Polypropylen und einen Füllstoff, Polypropylen und Ethylen-Propylen-Copolymerkautschuk und einen Füllstoff oder Polypropylen und Ethylen-Propylen-nicht konjugiertes Dien-Copolymerkautschuk und einen Füllstoff ist, einen Schmelzindex von mindestens 5 g/10 Min. aufweist.

6. Verfahren nach Anspruch 1 oder 2, wobei der Füllstoff (C) ein anorganischer Füllstoff, ausgewählt aus Talkum, Glimmer und Calciumcarbonat, ist.

7. Verfahren nach Anspruch 1 oder 2, wobei das behandelte Pigment (E) ein unbehandeltes Pigment und ein Metallsalz einer Fettsäure als Dispersionsmedium umfaßt.

8. Verfahren nach Anspruch 1 oder 2, wobei das behandelte Pigment (E) ein unbehandeltes Pigment und ein Polyethylenwachs als Dispersionsmedium umfaßt.

9. Verfahren nach Anspruch 1 oder 2, wobei das behandelte Pigment (E) ein unbehandeltes Pigment und ein Polypropylenwachs als Dispersionsmedium umfaßt.

10. Verfahren nach Anspruch 1 oder 2, wobei das behandelte Pigment (E) ein organisches Pigment, ausgewählt aus Polyazorot und Phthalocyaninblau, ein anorganisches Pigment, ausgewählt aus Titanoxid und Eisen(III)-oxid, Ruß, oder einem gemischten Pigment davon, umfaßt.

Revendications

1. Procédé pour produire une composition de résine thermoplastique colorée chargée (F), qui consiste à malaxer à l'état fondu une charge (C), au moins une partie des constituants de la résine comprenant une résine thermoplastique (A) et/ou une composition de résine thermoplastique (B), pour obtenir une charge enrobée, à ajouter à la charge enrobée l'éventuel reste de (A) et/ou de (B), et un pigment traité (E) comprenant un pigment non traité et un milieu de dispersion, puis à poursuivre encore la mise en oeuvre d'un malaxage continu à l'état fondu.

2. Procédé pour produire une composition de résine thermoplastique colorée chargée (F), qui consiste à malaxer à l'état fondu une charge (C) avec au moins une partie d'une résine thermoplastique (A) et/ou au moins une partie de l'un des constituants d'une composition de résine thermoplastique (B), à solidifier le mélange pour préparer un mélange-maître de charge (G), puis à malaxer à l'état fondu un mélange du mélange-maître (G), de l'éventuel reste de (A) et/ou de (B), et un pigment traité comprenant un pigment non traité et un milieu de dispersion.

3. Procédé selon la revendication 1 ou 2, dans lequel la résine thermoplastique (A) est le polypropylène.

4. Procédé selon la revendication 1 ou 2, dans lequel la composition de résine thermoplastique (B) est une composition comprenant un polypropylène (A) et un caoutchouc copolymère éthylène-propylène (H), un polypropylène (A) et un caoutchouc copolymère éthylène-propylène-diène non conjugué (I) ou un polypropylène (A) et un caoutchouc copolymère éthylène-butène-1 (J).

5. Procédé selon la revendication 1 ou 2, dans lequel la composition de résine thermoplastique (D), qui est une composition comprenant un polypropylène et une charge, un polypropylène et un caoutchouc copolymère éthylène-propylène et une charge ou un polypropylène et un caoutchouc copolymère éthylène-propylène-diène non conjugué et une charge, a un indice de fluidité d'au moins 5 g/10 min.

6. Procédé selon la revendication 1 ou 2, dans lequel la charge (C) est une charge minérale choisie parmi l'ensemble comprenant le talc, le mica et le carbonate de calcium.

7. Procédé selon la revendication 1 ou 2, dans lequel le pigment traité (E) comprend un pigment non traité et, comme milieu de dispersion, un sel métallique d'un acide gras.

8. Procédé selon la revendication 1 ou 2, dans lequel le pigment traité (E) contient un pigment non traité et, comme milieu de dispersion, une cire de polyéthylène.

9. Procédé selon la revendication 1 ou 2, dans lequel le pigment traité (E) comprend un pigment non traité et, comme milieu de dispersion, une cire de polypropylène.

10. Procédé selon la revendication 1 ou 2, dans lequel le pigment traité (E) contient un pigment organique choisi parmi l'ensemble comprenant le rouge polyazoïque et le bleu de phtalocyanine, un pigment minéral choisi parmi l'ensemble comprenant l'oxyde de titane et l'oxyde rouge, le noir de carbone, ou un pigment constitué de mélanges de ces derniers.